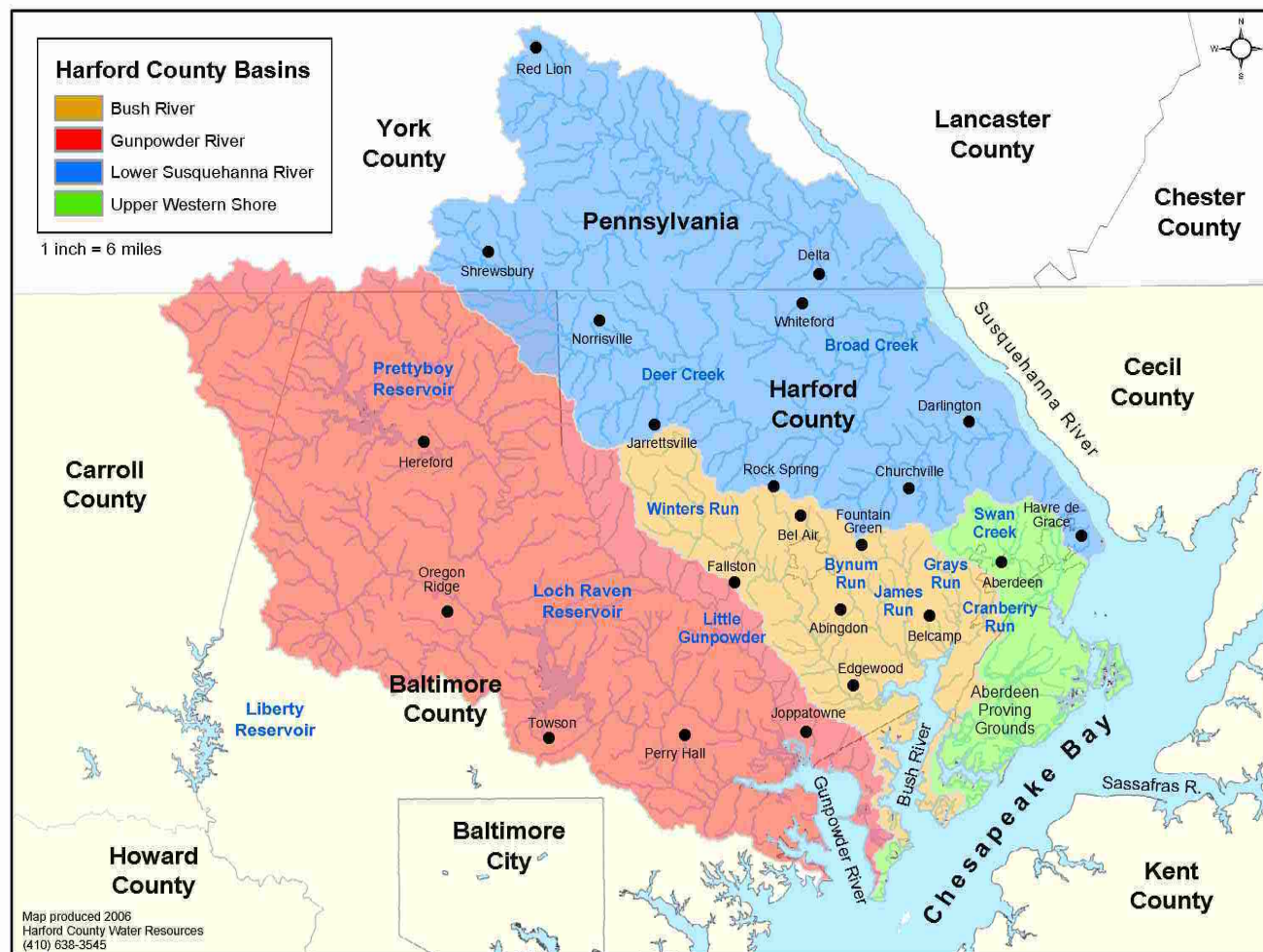


**Department of Public Works
Water Resources Engineering
212 South Bond Street
Bel Air, MD 21014
(410) 638-3545**

www.HarfordCountyMD.gov/WaterResources

Water Resources Engineering

- Program created as a result of new municipal NPDES permit requirements in 1992
- 5 employees (1 full-time, 3 part-time, 1 contractual)
- New water quality monitoring
- New education outreach programs
- New capital improvement projects
- Partnerships (Federal, State, County, Citizens)



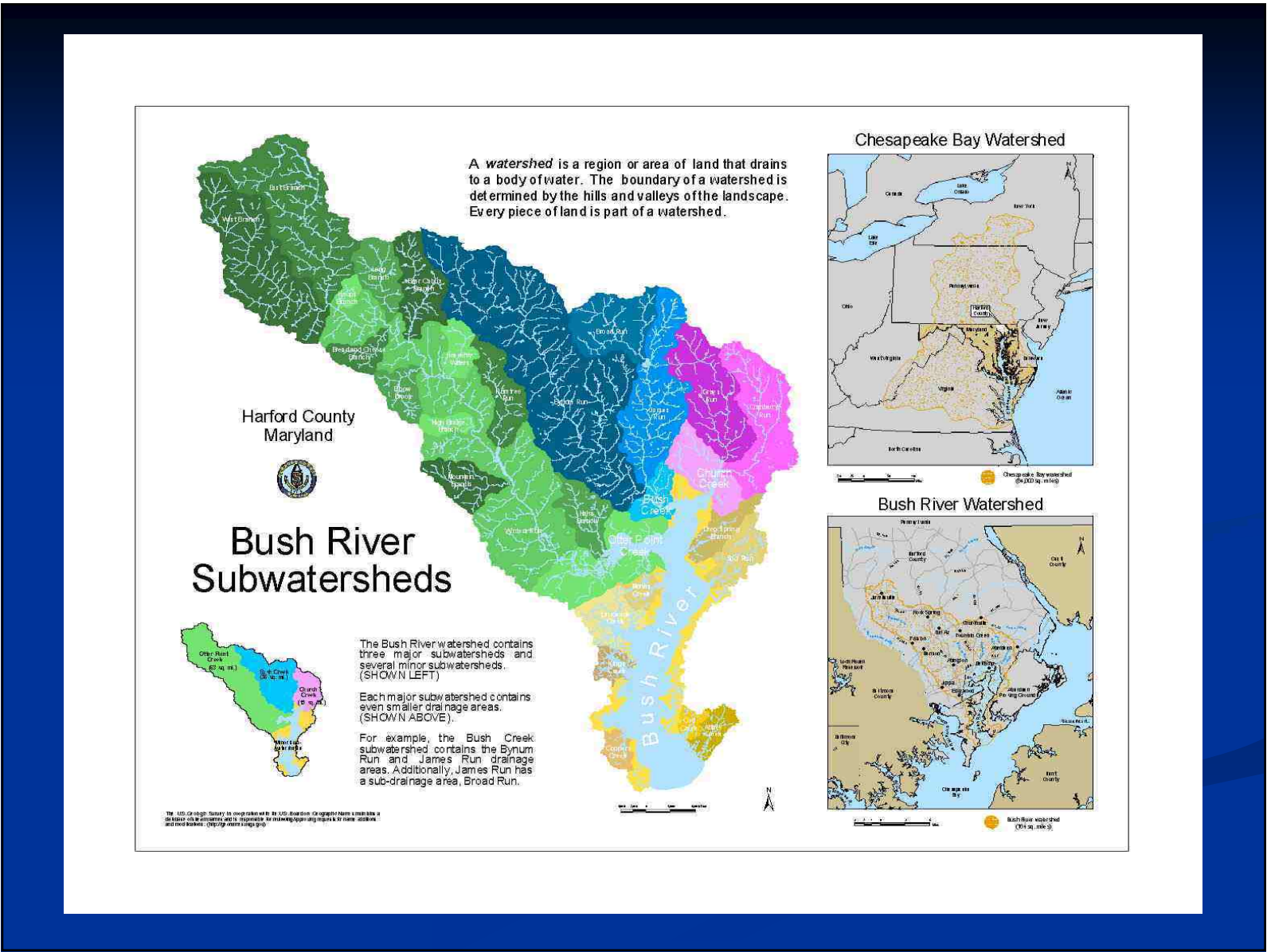
Bush River WRAS

- Bynum Run “pilot” stream survey 1996
- Winter Run stream survey 1999
- Church Creek stream survey 2002
- Watershed Plan completed 2003
 - Contiguous forest preservation
 - Buffer enhancement
 - Stream restoration & stormwater retrofit
 - Public outreach

Stream Surveys



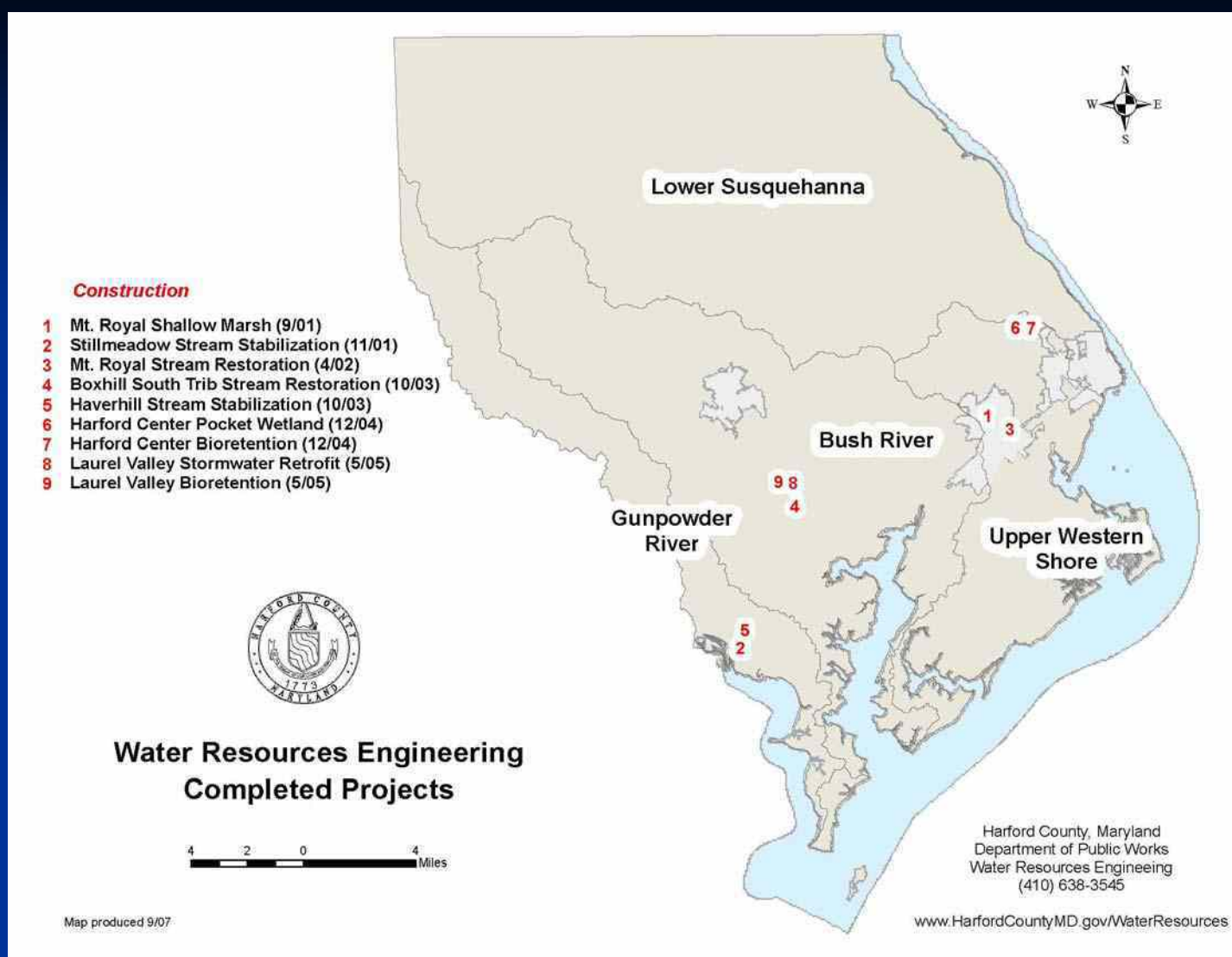
The image contains three photographs documenting stream survey work. The top-left photo shows a person in a white jacket standing in a stream, with a steep, eroded bank in the background. The top-right photo shows a person holding a sign with the number '13010' in front of a steep bank with exposed roots. The bottom-center photo shows a person holding a sign with the number '13011' in a stream, with a steep bank in the background.



Bush River WRAS Implementation

www.dnr.state.md.us/watersheds/wras

- Restoration projects (3 completed, 5 proposed)
- Erosion & Sediment Control program
- Stormwater Management program
- Adopt-a-pond
- Website
(www.HarfordCountyMD.gov/WaterResources)
- Video – “Along the River” (Available HC Libraries)
- Partnership with public schools
- Builders for the Bay





**Mt. Royal Avenue – Shallow Marsh
Mt. Royal Avenue and Rt. 22 - Aberdeen**



3 years after construction completed in Fall 2001



**Box Hill – South
Tributary
1998**

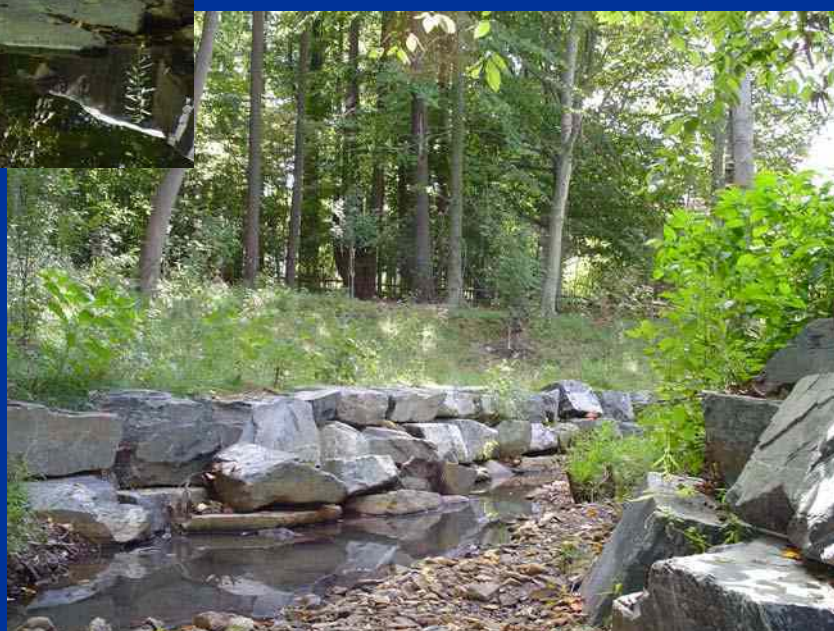




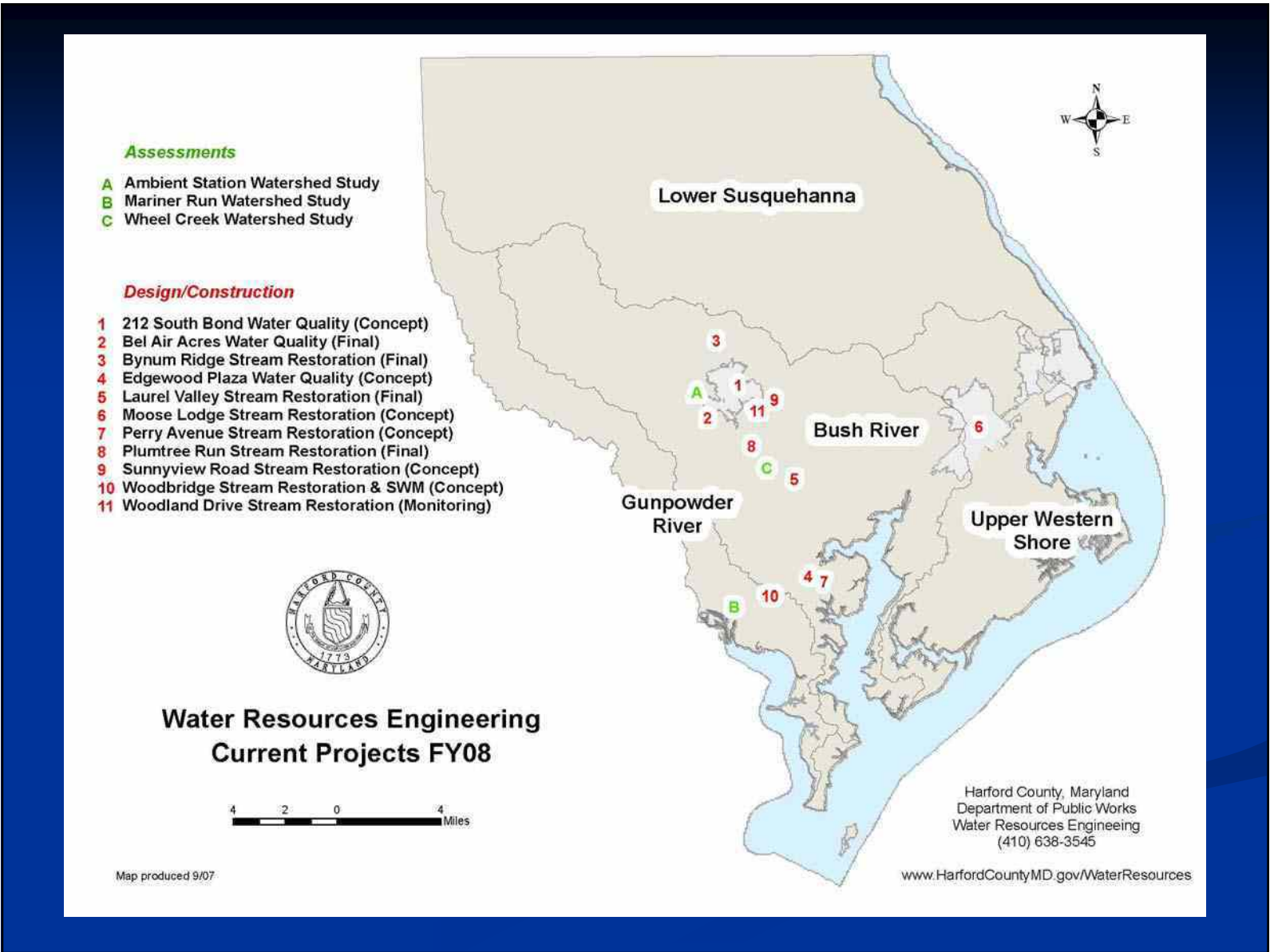
**Box Hill – South
Tributary
Summer 2003**



**Box Hill – South
Tributary
Fall 2004
One year post-
construction**



Physical / Biological
Monitoring



212 South Bond Street Water Quality



Concept

FY10 Design
FY10 Construction



(Figure 3)

Bel Air Acres Water Quality



Fully Funded



Final

Bynum Ridge Stream Restoration



FY09/10/11
Monitoring



Final

Edgewood Plaza



FY10 Design
FY11 Construction

Concept



Laurel Valley Stream Restoration



FY09/10/11/12/13
Monitoring

Grant Funded

Final



Moose Lodge Stream Restoration



FY09 Construction
FY10/11/12/13 Monitoring

Concept



Perry Avenue Stream Restoration



FY09 Design
FY10 Construction
FY11/12/13 Monitoring

Concept



Plumtree Run at Tollgate Rd Stream Restoration



**FY09/10/11/12/13
Monitoring**

Probably Grant Funded



Final

Sunnyview Stream Restoration



**FY09 Construction
FY10/11/12/13/14
Monitoring**



Concept

Woodbridge Stream Restoration & SWM



FY09 Construction
FY10/11/12 Monitoring

Grant Funded

Concept

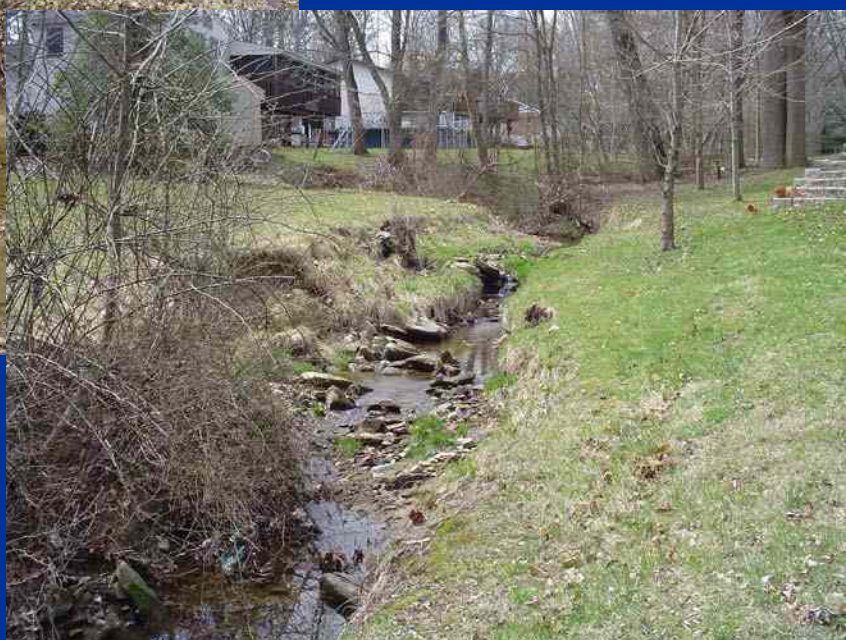


Woodland Stream Restoration



FY09 Design
FY10 Construction
FY11/12/13 Monitoring

Monitoring





Harford County Water Resources
(410) 638-3545

0 400 800 1,600 Feet



Harford County Water Resources
(410) 638-3545

Fernandez Branch Watershed

0 400 800 1,600 Feet

Watershed Development

- Nearly built out
- 71% properties built prior to SWM regulations
- 64% land developed prior to SWM regulations
- Older development in headwaters
- Glenwood Garth in-stream SWM facility



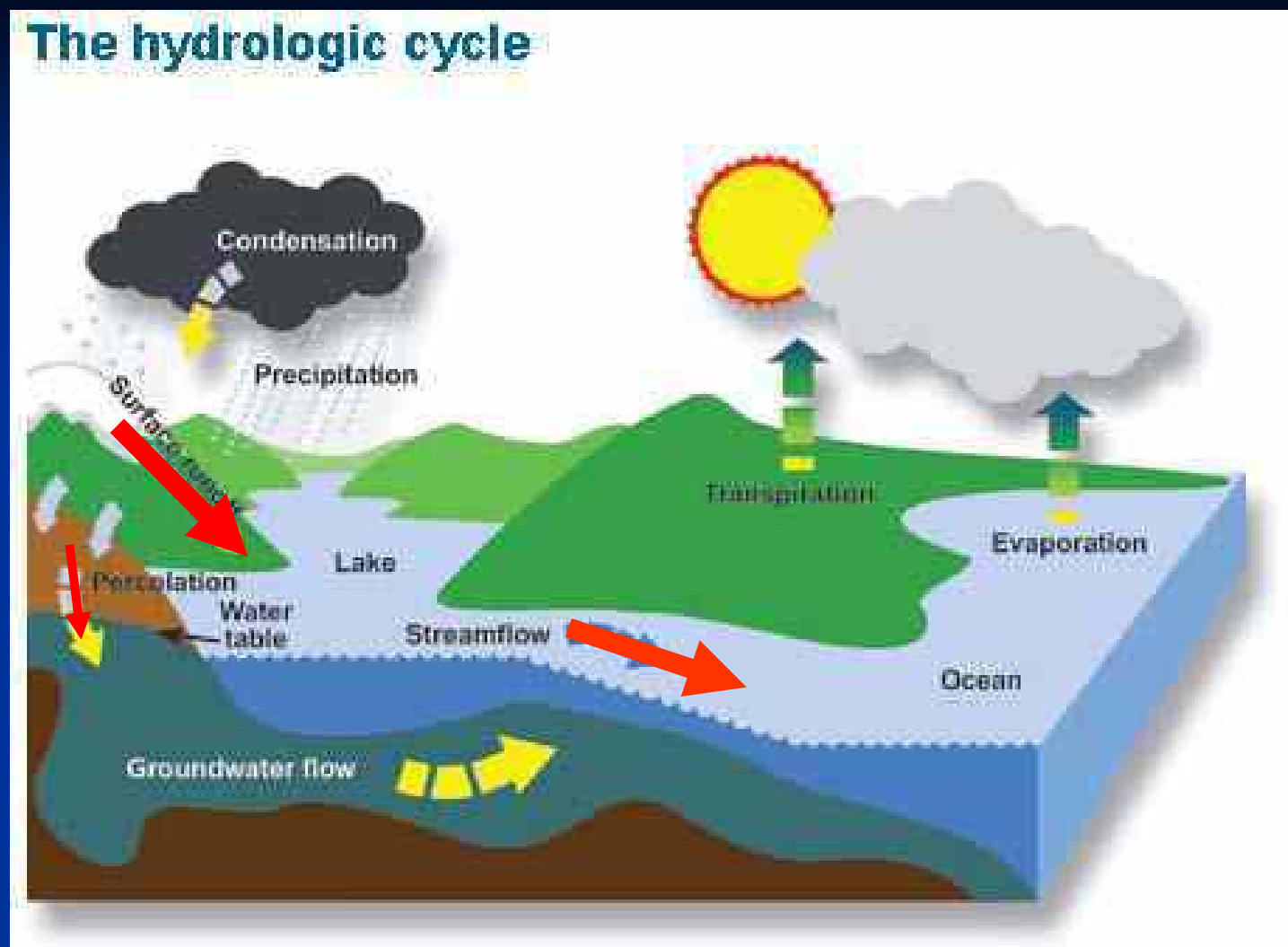
Harford County Water Resources
(410) 638-3545

Sunnyview Stream Restoration
0 100 200 400 Feet

Map produced March 2007

Property Owners

- Glenwood Garth
- 31 properties
- Built late 1980's, early 1990's
- 30% original owners
- 50% owners over 10 years



USGS 01581500 BYNUM RUN AT BEL AIR, MD

Available data for this site Surface-water: Peak streamflow ☐ GO

| | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|-------------------|-----------------------------------------|---------------|--------------------|-------------------|
| Harford County, Maryland Hydrologic Unit Code 02060003 Latitude 39°32'29.3", Longitude 76°19'48.4" NAD83 Drainage area 8.52 square miles Gage datum 250.88 feet above sea level NGVD29 | | | | Output formats | | | |
| | | | | Table | | | |
| | | | | Graph | | | |
| | | | | Tab-separated file | | | |
| | | | | WATSTORE formatted file | | | |
| | | | | Reselect output format | | | |
| Water Year | Date | Gage Height (feet) | Stream-flow (cfs) | Water Year | Date | Gage Height (feet) | Stream-flow (cfs) |
| 1945 | Jul. 19, 1945 | 6.25 | 3,620 | 1965 | Feb. 07, 1965 | 5.09 | 1,120 |
| 1946 | Dec. 25, 1945 | 5.40 | 565 | 1966 | Feb. 13, 1966 | 5.54 | 856 |
| 1947 | Jun. 14, 1947 | 6.01 | 1,920 | 1967 | Aug. 25, 1967 | 6.56 | 1,280 |
| 1948 | Jan. 01, 1948 | 5.48 | 633 | 1968 | Jul. 19, 1968 | 5.94 | 1,020 |
| 1949 | Mar. 23, 1949 | 5.40 | 565 | 1969 | Sep. 03, 1969 | 2.42 | 169 |
| 1950 | Sep. 10, 1950 | 6.18 | 3,080 | 1970 | Aug. 20, 1970 | 4.58 | 876 |
| 1955 | Aug. 13, 1955 | 4.86 | 1,010 | 1971 | Aug. 01, 1971 | 5.72 | 1,650 |
| 1956 | Sep. 06, 1956 | 3.86 | 576 | 1972 | Jun. 22, 1972 | 8.32 | 4,650 |
| 1957 | Nov. 02, 1956 | 6.04 | 1,700 | 1999 | Sep. 16, 1999 | 9.91 | 7,330 |
| 1958 | Dec. 20, 1957 | 4.75 | 955 | 2000 | Mar. 21, 2000 | 6.06 | 1,990 |
| 1959 | Sep. 02, 1959 | 6.05 | 1,700 | 2001 | Dec. 17, 2000 | 5.96 | 1,900 |
| 1960 | Sep. 12, 1960 | 5.78 | 1,520 | 2002 | May 02, 2002 | 2.93 | 330 |
| 1961 | Jul. 24, 1961 | 4.32 | 759 | 2003 | Sep. 23, 2003 | 7.49 | 3,500 |
| 1962 | Mar. 12, 1962 | 4.18 | 702 | 2004 | Jul. 27, 2004 | 6.24 | 2,160 |
| 1963 | Mar. 06, 1963 | 4.26 | 734 | 2005 | Nov. 28, 2004 | 5.62 | 1,620 |
| 1964 | Jan. 09, 1964 | 4.35 | 772 | 2006 | Jun. 26, 2006 | 9.23 | 6,090 |

Floyd

Isabel

[Questions about sites/data?](#) [Feedback on this web site](#) [Top](#) [Explanation of terms](#)

Timeline

- Year 1 Monitoring – 7/2005 – 6/2006
- Year 2 Monitoring – 7/2006 – 6/2007
- Year 3 Monitoring – 7/2007 – 6/2008
- Concept Design – 2/2007 – 12/2007
- Final Design (estimate) – 1/2008 – 6/2009
- Construction (estimate) – 6/2009 – 7/2009
- Post Monitoring – 2010 - 2015

Monitoring

- Four permanent cross sections
- Profile
- Bed & bank pins
- Sediment loads
- Discharge
- Aquatic insects





Photo 3 – Facing downstream along tributary toward Bynum Run confluence



Photo 4 – Facing upstream toward the riffle at the downstream proposed work limits



Photo 1 – View of Bynum Run facing downstream from tributary confluence



Photo 2 – View of Bynum Run facing upstream from tributary confluence



Photo 5 – View of bank erosion along the upstream right bank located just upstream of the downstream proposed work limits



Photo 6 – View of concrete placed along the upstream right bank located just upstream of the downstream proposed work limits



Photo 7 – Representative view (facing upstream) of an over-widened section within a wooded riparian zone



Photo 8 – Representative view (facing downstream) within a wooded riparian zone — note the sediment deposition



Photo 9 – View facing downstream at the Reach 1 and 2 interface



Photo 10 – View facing upstream from the Reach 1 and 2 interface



Photo 11 – Downstream view of bank erosion along a tight meander bend



Photo 12 – Upstream view toward the sediment transport sampling buckets



Photo 13 – Representative view (facing downstream) near the Reach 3 and 4 interface



Photo 14 – Upstream view of bank erosion—note exposed roots



Photo 15 – Downstream view of bank erosion along a residential yard



Photo 16 – Facing upstream toward the riffle at Option A of the upstream proposed work limits



Photo 17 – Facing upstream toward bank erosion located just upstream of Option A of the upstream proposed work limits

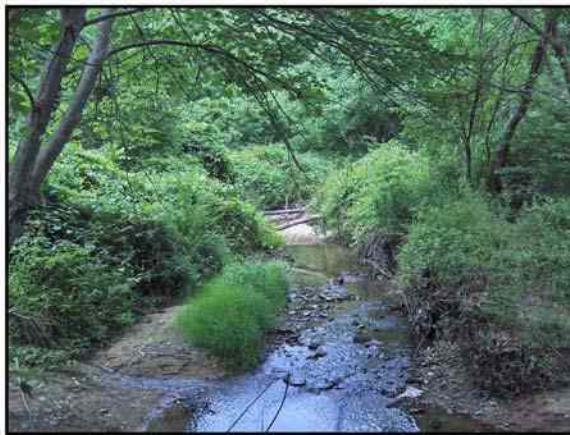


Photo 18 – Upstream view of a riffle located directly upstream of bank erosion shown in Photos 17 and 19



Photo 19 – Facing downstream toward bank erosion located just upstream of Option A of the upstream proposed work limits



Photo 20 – Downstream view of a tight meander bend with toe scour and potential for development of a chute cut-off channel



Photo 21 – Upstream view of a riffle feature at Option B of the upstream proposed work limits





River Birch



American Holly



Sycamore



Serviceberry



Viburnum



Witch Hazel



Chokeberry



Switchgrass



Black Eyed Susan



Joe Pye Weed

Timeline

- Year 1 Monitoring – 7/2005 – 6/2006
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